It will be borne in mind that I am here speaking of such *regulation* as is ordinarily necessary to ensure the proper management and reproduction, and to obviate waste and the gradual deterioration of the forest.

If the right so restricted were still such that forest management would be impossible, or if (as described in the last section) it is desirable to adopt such a management of the forest as necessitates a still further restriction of the right, so that its enjoyment would be seriously diminished, then the law refers the matter to the judgment of the Forest Settlement Officer, who (subject to the provisions for appeal, revision, &c.) may commute the right, *i.e.*, order its extinction subject to compensation.

A.—Grazing rights and grass-cutting.

§ 3.—*Questions arising.*

If the right-holders could graze an *indefinite* (*i.e.*, an unlimited) number of cattle, it is obvious that it would be impracticable to make any proper arrangements for forest conservancy whatever. Under cover of so wide a right, the claimant might introduce such a number of cattle into the forest that the owner of the forest would never get a seedling up and would never be able to re-plant a blank place. While, if it were attempted to confine the large number of cattle to a part of the forest, the cattle would starve, or the soil would be so overpastured and destroyed that in a few years nothing would remain.

The "happy mean" to be aimed at is to allow such a number of cattle to graze as will permit of proper periods of rest and protection to certain compartments or portions of the forest, while the remainder is grazed over, and that remainder should be of such extent that cattle can find sufficient food without being compelled to gnaw at roots of vegetation or trees, or pull down branches and bite off the young shoots.

The Indian law, therefore, requires that when cattle are allowed to graze inside the forest, it should be specified—

(*a*) what *number* is allowed ;

(*b*) what *kind* or description of cattle;

(*c*) within what *local limits* (portions of the forest) grazing is to be allowed;

(*d*) at what *seasons*;

as well as any other particulars regarding conditions necessary to be observed.

§ 4.—*The number of cattle.*

It very often, indeed most commonly, happens, that a grazing right is claimed in general terms, *i.e.*, it is not determined by the *terms of the right itself* how many cattle of each kind can be pastured in pursuance of it.

Under these circumstances, some systems of law have laid down certain principles for limiting the number of cattle which may claim to graze. These principles have no special reference to forests, and are equally applicable to grazing on a grass common, or heath, or any other place.

It should be remembered, however, that even where such principles are acknowledged as limiting the right in any case, the number of cattle may still be regulated according to what the forest can bear, whenever it happens that the right is to be exercised inside a forest.

Practically, therefore, the principles which I have alluded to are of only limited value; and with reference to *forest* grazing we do not care much about them. What is looked to is *the number which the forest estate* can properly pasture without injury to the forest, and that is really the only practicable principle to which ultimately we have to fall back upon.

It will, however, be interesting and profitable to understand also some of the principles first mentioned.

§ 5.—*Cattle required by owner for personal use. Cattle levant and couchant. Cattle for trade. Young of cattle included in number entitled.*

It is a proposition of general applicability, and one that we shall meet with again, that a right, not embodying by its nature any terms

to the contrary, always carries with it the meaning that it extends to the supply of the *personal and individual wants* of the right-holder, or of the house or land for the beneficial enjoyment of which the right exists. But this does not, in the case of cattle grazing, go any way towards defining the number.

In England and some other European countries, where the right is appendant (or appurtenant), it is always held that the number of cattle to be pastured, is the number which are "*levant-and couchant*" on the dominant estate. This phrase means that it is considered how many cattle can live on the fodder available to the estate which holds the right during winter, when the grazing ground is naturally not available, and the cattle are kept in stall.

As many cattle as the estate can find fodder for during winter, so many, and no more, it may take to pasture in the servient forests, or other property[4], during the grazing season.

In India such a test as this would not be useful. But it would be probably advantageous to adopt some of the other methods indicated in the footnote. It may be desirable to *count the houses* in the village and consider what *each really requires* for plough cattle and for supply of milk, &c. If the number varies from time to time, it will be fair to *take an average*, and that average would be equitably based on a period of twelve years, which is so usually adopted in Indian law.

It is always held that cattle kept, not for ploughing or for household wants, but as *stock for commerce*, are not included in the

[4] See Cooke, pp. 10, 11, and 23.

The Hanoverian law (Landes Œkonomie Gesetzbuch, 1864, p. 19) adopts this principle if the plan of taking an average cannot be followed. The three methods are—

(1) To take an average of the cattle actually in possession during the last ten years.

(2) The wants of each house with reference to the quantity of meadow and cultivated land attached to it.

(3) The estimate from wintering of cattle as above.

The rule in the text is applied in Prussia when the number is not otherwise ascertainable (see Eding, p. 90), and it is the sole test under the Saxon Mandats of 1813 and 1828 (Arts. 18 and 17 respectively) as it is in English law.

number entitled to graze[5]. To include them would offend against the principle that personal and individual wants are the measure of a right of user. A man requires cattle to plough his land, and give milk to his family; but if, besides that, he keeps cattle to sell and make a profit of, he can well feed them out of the profits: they are not necessary to his personal or household wants. (I am speaking always of course of rights where there is no proof of special terms to the contrary.) Such a condition is, I believe, generally to be found in Indian Forest Rules when the number of cattle is not expressly fixed, and it is certainly reasonable.

It is also questioned by some of the European authors whether *the young of cattle* are to be allowed in excess of a number fixed by any such methods as I have mentioned.

Meaume[6] thinks not, because of the abuse which might arise and the facility with which a fixed number might be exceeded under this pretext. In Prussia the young are not counted apart from their dams as long as they are sucking. The Bavarian law allows the young to be admitted without counting, up to a fixed age of one year[7]. Some such arrangement will probably be adopted in Indian practice. It seems reasonable to allow the young for a time, but when they are grown up and commence to graze on their own account, they must be regarded as in excess of a fixed number, and be dealt with accordingly.

§ 6.—*Case of flocks in the Himalaya.*

I need only allude to one other point, which probably affects only the forests situated in the North-West Himalaya.

Here, besides the villages on the spot, where grazing requirements have to be met, we have to deal with large migratory herds of cattle, chiefly goats and sheep, which remain in the forest at different altitudes, during the season when it is not possible to

[5] So in the French law (Code For., Art. 70), and in Prussia, Eding, p. 90 (D).

[6] Vol. I, p. 420, § 350.

[7] Roth, § 267: and so under the Saxon Mandat of 1828 (Grazing), § 16.

occupy the "Alpine" or upper grazing grounds which are at a great altitude, above the valuable and workable forests. During the winter the herds live in the lower hills. In the Kangra district, for example, such herds have for generations past, regularly grazed over certain areas of forest known by custom; and it is held that these cattle-owners have now a prescriptive right to this annual grazing for the winter season. Here it would be very difficult to introduce any rule about *numbers*.

The same herds, when moving up to the higher grazing grounds, sometimes stay for a time in the forests of middle elevation, where the deodár and mixed forests are, and often do great mischief. This, however, is not always the case; the herds often merely pass through the forest and do not remain and graze.

Whether any such herds have a right of grazing in any particular locality, must depend on the facts; but the subject is one requiring clear settlement, because it presents an instance of a double claim on the forest. Not only have the rights of the villagers on the spot to be met, which is what we usually expect in Indian forests, but a separate and numerous body of claims is introduced, the admission of which would overtax the resources of the forest, and at the same time unduly restrict the local villagers in an enjoyment of the forest, to which they would seem to have a much more proximate claim than the others[8].

I do not think that it could be made out that any of these migratory herds have established even such an equitable claim as should be treated as a right, and it will be necessary in settling hill forests to examine this matter thoroughly. I believe, as I said before, that the graziers in Kangra are held to have a right, but then it is their practice to stay for some months, and they have

[8] In the Chumba State this practice is very noticeable; but there the forest is leased to Government, and therefore the matter is settled by the rules annexed to the lease. The lease does not acknowledge any rights but such as belong to local villages and resident right-holders. In the Kulu forest (Panjab Himalaya) attempts have been made of late years to bring in herds of buffaloes to graze. This has been very properly resisted. The forests are, by effect of former settlement orders, burdened with many *local* rights, but are in no way bound to allow outsiders.

established a customary distribution of the forest area among the different herd-owners, and they regularly return to the same beats year after year[9]. It is more than doubtful whether any right of this kind can be made out in the case of herds traversing the forests of middle elevation (where the grazing does most harm).

§ 7.—*Other principles of regulating the number.*

So far I have spoken of the number of cattle, with reference to limitations dependent on the right being solely for personal wants, and on other conditions not directly connected with forest conservancy.

But the principle which I have established, points to the fact that even should the number of cattle commonable, be fixed on some such grounds as those indicated, *still* the forest must be considered, and no person can claim to send into it such a number of cattle as would prevent its reasonable maintenance and improvement.

§ 8.—*Acreage required for grazing.*

I may take it as certain that in most cases,[10] *some portion of the forest* will be closed as being full of seedlings, or because the young growth is not quite safe. What this portion is to be I will consider presently.

Assuming, however, that a certain acreage is open and the rest closed, it is obvious that no more cattle can be admitted into this open portion than it will support properly.

This is the principle which all the European laws admit[1]. If

[9] And in some cases folding their sheep on particular lands which get the benefit of manure. I believe that in one case a land-owner brought a suit to compel a shepherd to continue to so fold his sheep. This is very curious, because in English law a right of this kind, called *Frankfoldage*, used to be recognised (Williams, p. 275); but Williams says "it is one of those oppressive rights which the law permitted in early days, but which, I think, would now be scarcely tolerated."

[10] I believe that in Burma, and perhaps other countries with extensive forests, where cattle are not numerous and forest-grazing is only required during the rainy season, it does so little harm that it is allowed to be general.

[1] See the Austrian Forstgesetz (§ 10), where it is laid down in so many words.

more cattle were introduced, the animals would be improperly nourished, and would then in their hunger, gnaw and tear up the very roots of the grass and herbage, and so injure the production required for future grazing seasons. They would consume all tree seedlings on the ground, which, were herbage abundant, they would pass over, and they may even be driven by hunger to reach up to or bend down young stems and destroy their foliage.

If, then, we know the acreage open in each forest, and can classify it,—how much is good grazing ground, how much middling, and how much bad; and if we know on an average what area of each sort will support a given number of head of cattle, it will only be a matter of arithmetic to fix the total number of cattle which might be admitted.

Unfortunately as yet we have no data, or no sufficient data, on the subject. We can only therefore, at present, go on an estimate, the best we can make in each case, after studying the ground. It is still fortunately the case in many localities, that the number of cattle needing grazing inside the forest, is not excessive in proportion to the area available. But this is not always the case, nor, it should be remembered, is such a state of things in any case likely long to continue. In some cases the difficulty has already arisen: for example, when it is desired to provide for a grazing right by cutting off a suitably convenient piece of the forest. Here it is very difficult to make a guess what is the area which should be excluded as sufficient for grazing of a given number of cattle. The collection of statistics on this head, and the gradual record of practical experience, is therefore much to be desired.

Those who are willing to look into the subject more closely will find it treated of in great detail by Dr. Pfeil[2]. The information, however, given by this author relates to such a climate as Germany has. It is only therefore by way of illustration, that I give a brief outline of the way in which this question may be studied.

[2] Pfeil, § 39, pp. 227—249.

The author recommends the division of the area into a few general classes according as it produces more or less grass and herbage; he proposes that trial plots should be marked off for each kind, and cattle fed on them so as to get at actual results. In the best soil (best as regards growth) 1½ *morgen* (or acres) will feed one cow or 10 sheep; and generally, if 3 *morgen* will feed a cow it will take 4½ to feed a horse, 3⅔ to feed a draught-bullock, and $\frac{3}{10}$ to feed a sheep.

Or, in other words, given the area sufficient for one cow; multiply it by 1·5 to get the area for a horse, by 1·2 that for a draught or plough bullock, and divide by 10 to get the area for a sheep.

In all cases the value of each class as regards grass-growing, is liable to be much affected by the shadow of the trees[8].

§ 9.—*The kind of cattle.*

It will often be found that, looking to the previous custom and practice, there is no doubt that the right as it stands, includes the grazing of goats or other noxious animals. And if the claim is to be admitted as a right at all, the grazing of these animals must be admitted as part of it. Therefore, the question of the prohibition of grazing, as regards certain kinds of cattle, injurious to the forest, is a matter of *regulation* or limitation of the right as it stands.

The animals which are most injurious are goats, camels and elephants.

§ 10.—*Elephants.*

Elephants of course may do great damage, but their grazing is so seldom required, and only in remote jungles, that practically it needs no mention. In some cases also it is effected by cutting boughs, so that the subject belongs rather to the question of lopping trees, than to grazing.

[8] See Revue des Eaux et Forêts, January 1881 (p. 5), for some French statistics. In France 40 head of cattle is the average to 100 hectares. A cow and a horse take the same: 10 sheep or 4 pigs = 1 cow. This gives about 6·25 *acres* to each cow.

In the mountain grazing grounds and forests of the Hautes Alpes, the average is 14 head to 100 hectares.

§ 11.—*Camels.*

Camels are, fortunately for forest interests, only found in parts of India, and mostly in places where a desert, scrubby growth renders it impossible to secure forests for any higher purpose than fuel-coppice. Nevertheless, in North India and elsewhere, these fuel forests are of great importance. The fuel-supply, not only of towns, but even of long lines of railway, may be more or less completely dependent on them.

Unless in such localities there happen to be an under-growth of such plants as camels eat (*salsola, coronylon,* &c.), camel-grazing means simply browsing on the top-shoots and twigs.

Prosopis spicigera, which forms large forests in the Panjáb, is an especial favourite with camels. Nor is it possible to prevent the herdsmen aiding this "grazing" in a peculiarly dangerous manner. As the animal does not like to stoop to eat, the herdsman attacks the leading stem of each tree with a billhook on a pole; he half cuts through the wood and then bends down the bough, of course tearing a long strip of bark and sapwood with it. The animals then reach and nibble at the hanging boughs.

No forest can possibly survive camel-grazing for long. In the case of the dry forests of *prosopis,* this species is so deeply rooted that it long continues the struggle; but the stems become gnarled and stunted, and even it must at last succumb.

Camel-grazing cannot, therefore, be allowed in any permanent fuel reserve, or in any dry forest of the lower hills.

It is best to give up tracts in the interior (as in the Panjáb "bâr") to this purpose. Camels are in fact quite incompatible with a highly-cultivated district, and can only be reared successfully in the bâr and in desert countries.

§ 12.—*Goats.*

Goats are hardly less injurious: no forest can survive their attacks. Many species, which they do not eat, they nevertheless nibble at. The roots and stalks of vegetation also do not escape them.

"These animals," says Meaume[4] (without the least exaggeration) "are the scourges of the young forest; they destroy all hope for it. They paralyze reproduction, and a young tree once browsed must be cut back to the root if it is ever to recover."

By the French law (Code For., Art. 78) the grazing of goats in a forest is prohibited, "notwithstanding all rights and actual enjoyments of the practice to the contrary."

This prohibition is of very ancient date. It is found in the 15th article of the celebrated Forest "Ordonnance" of 1669[5]. In the days of Francis I, a law of A.D. 1541 recites still earlier laws having the same object.

In England, Manwood[6], speaking of the ancient times, when a "Chief Justice in Eyre," went his rounds to try forest cases, and took the opportunity of charging the forest officers as to their duty, tells us that one of the things which the Justice noticed was the subject of goat-grazing. "You shall enquire if there have been any * * * * * goats that have been attached since last session within the forest; of the number and price of them you shall do us to weet: for they be forfeitable by the forest attachment, for they be no beasts of common[7]."

[4] Vol. I, p. 424, § 354.

[5] Which did not allow goats even in "*places vaines et vagues*" (bare spots) on the borders of the forest, for fear they should stray into it.

[6] Cap. 24, p. 521.

[7] The same author (p. 222) records that, at the assizes of the forest of Lancaster (in Anne. 10, Session I), the townspeople claimed a right of grazing in the forest and got it. But it was then held for law that neither sheep, swine, nor goats are allowed to have common within the forest. And in the "*Assisa Forest a de Pickering : fol. 67*," it is also decided "that no man may common with goats in a forest."

It is probable that these early laws in England prohibited goats because they interfered with the forest for hunting purposes, or because of certain technical definitions. And Williams says (p. 168), that there might be a *custom* that goats grazed with other cattle on a common (though such a custom would not be possible in a forest). But still the existence of such a rule, long after the older barbarous forest laws had been swept away, shows that there has been always recognition of the fact that the lower interest must give way to the higher; the selfish pleasure of the chase may indeed have been a very poor representative of a higher interest, but the benefit to the whole country by forest protection is a really higher interest. The French law, from the very first, seems to have been *bonâ fide* for the protection of the forest.

The German authorities are also quite clear. Not only are goats forbidden by the Austrian law, but the 65th Article provides that if goats are found trespassing in the forest, and cannot be caught and taken to the pound, they may be shot.

vonBerg[8] says that "nearly all the German States, and most rightly so, prohibit goats in a forest."

The Italian law does not expressly forbid goats; it probably considers the power of getting rid of rights, by compensation, sufficient.

In India, no forest law has as yet specifically prohibited goats. But there is the general rule that rights inconsistent with the maintenance of the forest are to be commuted.

As the foregoing authorities show that goat-grazing is regarded as inadmissible in nearly all countries where natural forests are properly cared for, it may certainly be concluded that a Forest Settlement Officer in India will, as a rule, be justified in deciding that goat-grazing is inconsistent with the maintenance of the forest, and directing its commutation.

But it should be remarked that this is not always necessary, and that where other plans of arranging for goat-grazing can be devised they should be followed.

There may be cases where it is a question of a few goats only for a household. The goat is often the "poor man's animal," and where provision has to be made only for a limited number in the village, it is particularly easy to give up a small corner of forest for the purpose. Where the herds are large, and there is no grazing ground, or only of limited extent, then the sooner the people change their habit the better. It should be borne in mind that where a population voluntarily establishes a state of things which is inconsistent with natural conditions, nature will sooner or later avenge herself, and compel the abandonment of the practices that oppose

[8] Pages 215, 219, and see Eding, p. 89; Prussian Grazing Regulation (22nd November 1838); Rönne, pp. 421 and 794. Eding mentions that goats are allowed in Prussia in places where they can do no harm.

her. It is of no lasting advantage to give up the forest, because the goats will soon cause it to disappear, and then *exactly the same result* will follow, as if the Forest Settlement Officer had refused to burden the forest in the first instance: the goats *must* go; only that then the public will have been injured, perhaps irretrievably, by the loss of the forest as well.

I am well aware that it is much easier to write things of this kind in paper than to make satisfactory arrangements in a given forest. But principles must be stated, and there can be no doubt that if Forest Settlement Officers once really understand the truth and appreciate the facts stated, the difficulty of making an arrangement will appear less formidable than it does when the mind still retains the conviction that goat-grazing does no harm.

It is always, as I have said, possible to provide for a few household goats: herds kept for milk on a small scale, or even sufficient for the supply of a large town, certainly *can* be maintained outside a forest, for they are so, constantly, in places where no forest exists: large herds such as those of the hill "gaddis" *can* only exist when "Alpine" pasture grounds are available.

§ 13.—*Sheep.*

In France sheep are prohibited as well as goats; but with the proviso that special permission for their grazing may be given. In England, as the previous notes show, sheep, as well as goats, are excluded from "common of pasture." In some German States sheep are allowed if there is grass[9].

They may be regarded as less noxious than goats, but should be prohibited wherever possible, unless grass is abundant.

§ 14.—*Buffaloes.*

Buffaloes cannot always be excluded; but they are very dangerous, especially on steep slopes, where their heavy tread lays bare the roots of trees, reduces the soil, and may even give rise to small ravines or water channels, which deeply indent the soil.

[9] vonBerg., p. 219.

This fact must be borne in mind in fixing the *parts* of a forest in which such grazing is allowed.

§15.—*Extent of forest open to grazing with reference to state of growth.*

The data of European forests can only be useful here as an illustration of the method in which questions of the sort may be settled, and as an indication of the information we shall gradually require to possess ourselves of.

The French law, as to the extent of forest to be open, is very simple. The Code Forestiére (Art. 67) declares that grazing can go on only in those "*cantons*" or portions of the forest declared by the forest administration to be "*defensable*," *i.e.*, out of danger from grazing. A list of cantons open to grazing is published every year, and if any one contests this[10] he can do so by reference to the "*Conseil de Préfecture.*"

In most of the German States, the rule is that grazing rights may be kept out of those parts of the forest where the growth is so young that the tender shoots are in danger of being broken or browsed[1].

Long experience, however, has in these countries enabled an *age* of safety to be laid down for each different kind of forest. Moreover, as forests are under regular treatment, it will usually be a definite and known proportion of the forest area that is of each age.

Hartig[2] gives the following list of ages at which the forest is safe :—

High forest (deciduous) . .	20—25 years	(according as the rotation
Coppice (25 years' rotation) .	8—10 „	is 80 years or 100
Pine forest	13—16 „	years).
All blanks restocked . .	20—30 „	

[10] *e.g.*, objects to the propriety of the forest officer's decision as to the necessity for closing some places; complains that insufficient allowance for grazing rights is made, &c.

[redacted], § 266, and authorities quoted: Eding, 185.

[redacted]Rönne, p. 717.

Hundeshagen's table[3] is according to quality of soil which affects growth :—

		Against large cattle.		Against sheep.	
		Good soil.	Bad soil.	Good soil.	Bad soil.
		Years.	Years.	Years.	Years.
1	Beech and oak high forest (other deciduous forest a little less.)	18	24	14	18
2	Beech (simple coppice and stored coppice.)	14	18	10	12
3	Oak (simple coppice and stored coppice), (coppice of other species a little less.)	10	14	7	10
4	*Abies pectinata* and *A. excelsa* .	16	20	12	16
5	Pines and larches . . .	12	16	9	12
6	Poplars, willows, &c. . . .	6	9	4	6

The Saxon law[4] goes by the height of the trees. Thus, the forest is closed against—

Horses, till the trees are 6 *ells* high (about 19 feet).
Horned cattle, ditto ditto about 13 feet.
Sheep, ditto ditto 2½ *ells* high (about 8 feet).

Hartig[5] gives the same list, but fixes the height that is secure at 13, 9 and 5 feet respectively.

It will be readily understood that in all forests which are in a normal state of growth, a regular gradation of age classes will have been already attained, a certain proportionate area being occupied by each age. Consequently, if you have fixed an age at which the compartments are safe from damage, it is easy to point out what compartments are open, and will successively become so; and these will always be a more or less definite proportion of the whole

[3] vonBerg, p. 280, &c.

[4] Mandat of 1813, § 8.

[5] *Forst und Jagd-Staatsrecht*, p. 175. Eding remarks on this, that height is not always a sufficient test, as oxen are in the habit of bending down young st[illegible] and eating off the leaves.

area of the forest according to the rotation period on which it is being managed[6].

I have gathered, by way of example, a table showing the proportions to be kept closed in different kinds of forest, as stated by different authorities. But these assume the forest to be in a fairly normal state—

Authority.	Kind of Forest.	Proportion to be closed.
Grabner (Austria) ..	All high forest	At least $\frac{1}{6}$
	All coppice (both simple and stored)	„ „ $\frac{1}{6}$
Hartig (As in Rönne, page 717.)	Deciduous high forest . ..	At least $\frac{1}{4}$
	„ coppice, &c. ..	„ „ $\frac{1}{3}$
	Blanks[7] in either	„ „ $\frac{1}{2}$
	Coniferous high forest ..	„ „ $\frac{1}{6}$
	Blanks in ditto	„ „ $\frac{1}{3}$
Von Cotta (As in his "Waldbau" quoted by von Berg, p. 222.)	Beech and *abies pectinata* ..	$\frac{1}{4}$ to $\frac{1}{5}$
	Oak	$\frac{1}{6}$ to $\frac{1}{5}$
	Conifers generally ..	$\frac{1}{5}$ to $\frac{1}{10}$
	Ashes, elms, maples, &c. ..	$\frac{1}{5}$ to $\frac{1}{8}$
According to Hannover: Ablösung Ordnung of 8th November 1856.	Pine forest	$\frac{1}{4}$
	Deciduous high forest ..	$\frac{1}{5}$
	„ coppice	$\frac{1}{4}$
	Unstocked and sparsely-wooded places	$\frac{1}{12}$

[6] Supposing a regularly-stocked pine forest to be worked on a rotation of 120 years, it is obvious that trees aged from 1 to 20 years will occupy one-sixth of the whole area; and if pine trees must be protected against grazing till the 17th, or, say, till the 20th year, about one-sixth is the proportion of a normal pine forest managed on such a rotation, which will always be under closure. A deciduous coppice will probably have a rotation of 30 years; then as coppice trees will be unsafe till 10 years old, *one-third* of the area, stocked with young trees 0—10 years old, will be under closure. An irregular or badly-constituted forest would, of course, require a much larger area closed.

[7] Hartig adds: "blanks, *if they are to be stocked*," for it is often useful to leave [redacted]ks unplanted, at least for a time, so as to let grazing continue on them, and thus [redacted]rest of the forest.

These illustrations will, in India, serve only as indications of the direction in which we must labour to acquire data. Even if our forests were, as a rule, much more normally stocked than they are, the figures indicating ages and proportions of area would have to be adjusted to the facts of growth, climate, and so forth. But as it is, our forests are often in a highly irregular, if not partially ruined, condition, and have neither a constituted gradation of age classes, nor even a tolerably uniform covering of mixed age. We must, therefore, be guided by circumstances, and always allow for as large a proportion of area to be closed as is possible, without unduly diminishing the number of cattle which might otherwise be fairly admitted under the right established.

Where, as I have said, the forest is so injured that it is of importance to close it altogether, recourse must be had to compensation.

A very important point must here be mentioned in connection with the *locality* of the exercise of grazing rights. As we are rarely able to lay down beforehand a distinct series of compartments in which grazing will be allowed one after the other, as each attains a certain age, it is of the utmost importance to provide that, of an estimated *total* acreage to be kept closed, the forest officer in charge shall always have the power to determine *where* the closed portions are from time to time to be located. He will be responsible that he makes reasonably convenient arrangements; but under no circumstances is it right to mark permanent blocks inside the forest on which grazing is always to be allowed. The sites must be changed after a certain period, so as to allow rest to one place while another is open. The mistake of fixing open portions was unfortunately made in the Hazára Settlements, Panjáb. The consequence has been that already a marked difference between these spots and the rest of the forest is observable. In time these spots will become quite bare, and the arrangement will have to be revised[8].

[8] Grabner, p. 260. In the Hazára Forest the blocks opened for grazing are already distinguishable, not only on the map, but on the ground, their denuded surface being marked out at the first glance.

§ 16.—*The season of grazing.*

The regulation of this matter will often in itself secure a certain amount of protection to the forest, especially under the present necessity for a mere estimate of, or guess at, the proportions of the area which must be kept closed. It may be found that, locally, grazing is only required during certain seasons, and the absence of grazing at other times may not only emphasize the good done by the absolute closing of a limited portion, but may give the whole forest a certain period of rest, to its manifest advantage. Two points have to be considered—

(1) The season at which grazing is most wanted, and

(2) The season at which the forest most needs to be let alone.

For example, in the bamboo forests of Hushyárpur (Panjáb) grazing has always, in accordance with standing custom, been excluded during two or three months of the rainy season, when the young bamboo shoots are sprouting. In Burma, on the other hand, the rainy season is the time during which the forest is almost wholly uninjured by grazing, and fortunately this is the time at which forest grazing is required[9].

All interests must be considered, and certain compartments be closed absolutely, while others are opened at certain seasons or all the year round for a certain number of years.

Eding remarks[10] that cattle must not be admitted in open compartments too early in the spring, before the grass has grown, or else the cattle will be compelled to nibble at the twigs of trees just budding into leaf.

[9] It sometimes happens that in the deodar forests of the North-West Himalaya, in which a good crop of deodar seed does not ripen every year, it may be useful to allow cattle grazing over the whole forest during the period when herbage grows rapidly; the cattle thus keep down the growth and prepare the soil to receive the seed when it falls. Just before the cones ripen, all cattle must be excluded, and thenceforward be kept out of the portions in which the seedlings are growing, till they are of sufficient height to be safe.

[10] Eding, p. 88 (B).

§ 17.—*Other particulars to be regulated.*

A few other matters remain to be noticed, which I have found in the European text-books, and which may afford useful hints for Indian Forest Settlements.

It almost goes without saying, that where grazing is admitted, unless the grass is so superabundant that no diminution of the grazing would be caused by the practice, neither the forest-owner nor other right-holders can be permitted to spoil the grazing by cutting the grass first[1].

Most laws require[2] that a responsible herdsman should be appointed. In India, children are often sent out with the herds, so young that they cannot be held liable for trespass, nor have intelligence enough to control the herds.

Portions of the forest that are closed must, if possible, be protected by ditches 4′ by 2½′, over which cattle cannot pass, or at least marks (such as bundles of grass tied on to stakes driven into the ground) should be put up to warn graziers of the prohibited places[3].

The forest-owner is bound to provide a proper way for the cattle[4] to get to the open parts of the forest, and should take the precaution of fencing or otherwise keeping the cattle from wandering off the way provided[5].

If the owner does not fence, the cattle-owners will not be responsible for trespass, unless it can be shown that they were guilty

[1] *Eding.*, p 92.

[2] So in the Austrian law, and in Prussia (Rönne, p. 717, &c.), cattle bells are also required, and herdsmen must keep together; so in the Bavarian law of 1852, section 43, and the French Code, Forest, Art. 72. Art. 73 requires cattle to be marked with a special mark for each commune or right-holder, and Art. 75 requires the use of cattle bells.

[3] See Grabner, as to this provision of the Austrian law.

[4] Saxon Mandat, § 11, and Roth, § 271.

[5] The French law (Art. 71) requires the route to be fixed, and, if need be, fenced or ditched at the joint expense of the forest-owner and the right-holder. We could hardly apply this rule in India, unless, indeed, under special circumstances, the Forest Settlement Officer saw fit to lay it down as a condition of recognizing a right of grazing.